Gratifying the Biomedical Researcher: Introducing the Negative Search Interface

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> Because of the importance of originality in science, tradition requires that a scientist acknowledge in his publication those whose work in the field preceded his. The mere absence of such acknowledgement constitutes a claim for originality.[1]

Huth[2] describes the information needs of biomedical researchers as requiring "exhaustive search[es] of information sources ("the literature") but at infrequent intervals." This presentation introduces a new search interface for biomedical researchers for use with the MEDLINE database. This user group has a search strategy need which is similar to the "negative search" strategy proposed by Stielow and Tibbo.[3] The negative search interface is designed to facilitate a specific type of bibliographic searching done by those who are executing original research in new areas. Briefly, the negative search strategy enables a searcher to systematically and exhaustively search a database to determine whether research has been published in a particular topic area. Search interfaces, such as GRATEFUL MED, do not aid this type of search because they are designed for clinicians who expect to find *existing* information to solve clinical problems (positive searches).[4,5] Biomedical researchers, on the other hand, *do not* expect to locate information, for it is the absence of prior publications which"constitutes a claim for originality" in scientific research.

The effectiveness of an exhaustive search is measured by recall, with 100% recall indicating a completely exhaustive search. To facilitate exhaustive searches, the design criteria for the negative search interface consists of two elements: the aiding of query expansion and the tracking of search histories, both of which are done off-line. Query expansion is the process in which various terms are analyzed for possible query inclusion if they more thoroughly describe the topic of a search. To aid query expansion, the negative search interface will retrieve the hierarchical structure of the MeSH Trees surrounding each candidate query term. By having the MeSH Trees available, a searcher can view related, i.e., broader and narrower, terms for possible query expansion. The availability of medical synonyms also allows a searcher to view alternative terms. In both cases, the information returned by the system offers choices for the enduser to select for use during query expansion.

The negative search interface also tracks search histories by term and by topic. The purpose of tracking search histories by term is that a searcher must know the specific Boolean combinations in which a term has been used and when those searches were executed. Tracking search histories by topic allows the searcher to review all previous search queries in a given topic area. Dates of prior search executions are tracked so that they can be periodically reexecuted to update search records. Tracking search history is crucial for exhaustive searches which occur over long periods of time so that a topic area can be systematically searched.

The intent of the negative search interface is to provide GRATEFUL MED-type access for a very specific kind of searcher, the biomedical researcher, and has been developed with their unique information needs in mind.

References

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0195-4210/95/$5.00